GE Healthcare

Patient Data Module (PDM)

Service Manual

Software version 1

Patient Data Module
English
2030048-001 (cd)
2030046-001A (paper)
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NOTE

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1 Introduction

Manual information

Revision history

Each page of this manual has the document part number and revision letter at the bottom of the page. The revision letter identifies the document's update level. The revision history of this document is summarized below.

Revision	Comments
A	Initial release.

Manual purpose

This manual provides technical information for service representatives and technical personnel for maintaining the equipment.

Intended audience

This manual is intended for service representatives and technical personnel who install, configure, maintain, administer, troubleshoot, or repair this equipment.

Ordering manuals

A paper copy of this manual will be provided upon request. Contact your local GE representative and request the part number on the first page of the manual.

Safety information

Responsibility of the manufacturer

GE is responsible for the effects of safety, reliability, and performance only if:

- Assembly operations, extensions, readjustments, modifications, or repairs are carried out by persons authorized by GE.
- The electrical installation of the relevant room complies with the requirements of the appropriate regulations.
- The equipment is used in accordance with the instructions for use.

Intended use

This device is intended for use under the direct supervision of a licensed health care practitioner.

This device is not intended for home use.

Federal law restricts this device to be sold by or on the order of a physician.

Contact GE for information before connecting any devices to the equipment that are not recommended in this manual.

Parts and accessories used must meet the requirements of the applicable IEC 60601 series safety standards, and/or the system configuration must meet the requirements of the IEC 60601 medical electrical systems standard.

Periodically, and whenever the integrity of the device is in doubt, test all functions.

The use of *accessory* equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include:

- use of the accessory in the *patient vicinity*; and
- evidence that the safety certification of the *accessory* has been performed in accordance to the appropriate IEC 60601-1 and/or IEC 60601-1-1 harmonized national standard.

If the installation of the equipment, in the USA, will use 240V rather than 120V, the source must be a center-tapped, 240V, single-phase circuit.

Hazard definitions

Warnings and Cautions are used throughout this manual and designate a degree or level of hazardous situations. A hazard is defined as a source of potential injury to a person.

DANGER
DANGER— indicates an imminent hazard which, if not avoided, will result in death or serious injury.

WARNING
WARNING— indicates a potential hazard or unsafe practice which, if not avoided, could result in death or serious injury.

CAUTION
CAUTION— indicates a potential hazard or unsafe practice which, if not avoided, could result in minor personal injury or product/property damage.

NOTE

A NOTE provides application tips or other useful information.

Patient Data Module hazards

WARNING

ACCIDENTAL SPILLS—To avoid electric shock or device malfunction liquids must not be allowed to enter the device. If liquids have entered a device, take it out of service and have it checked by a service technician before it is used again.

Equipment symbols

The following symbols appear on the equipment.

ATTENTION: Consult accompanying documents before using the equipment.

Defibrillator-proof type CF equipment; type CF equipment is specifically designed for applications where a conductive connection directly to the heart is established. The paddles indicate the equipment is defibrillator proof.

Defibrillator-proof type BF equipment; type BF equipment is specifically designed for applications intentional external and internal application to the patient, excluding direct cardiac application. Type BF equipment is type B equipment with an F-type isolated (floating) part. The paddles indicate the equipment is defibrillator proof.

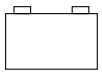
4P41

Medical Equipment
With respect to electric shock, fire and mechanical hazards only in accordance with UL 60601-1, CAN/CSA C22.2 NO. 601.1, IEC 60601-1, IEC 60601-2-27, IEC 60601-2-30, IEC 60601-2-34, and IEC 60601-2-49.

This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.

2006-08

This symbol indicates the date of manufacture of this device. The first four digits identify the year and the last two digits identify the month.


Battery

Communication

Power

ePort connection

Zero all

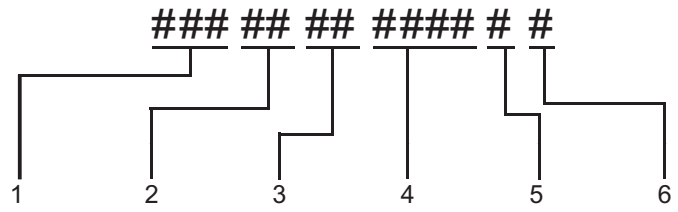
Service information

Service requirements

- Refer equipment servicing to GE's authorized service personnel only.
- Any unauthorized attempt to repair equipment under warranty voids that warranty.
- It is the user's responsibility to report the need for service to GE Medical Systems *Information Technologies* or to one of their authorized agents.
- Failure on the part of the responsible individual, hospital, or institution using this equipment to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards.
- Regular maintenance, irrespective of usage, is essential to ensure that the equipment is always functional when required.

Equipment Identification

Every GE Medical Systems *Information Technologies* device has a unique serial number for identification. A sample of the information found on a serial number label is shown below.



	Description
1	Product code[1]
2	Year manufactured
3	Fiscal week manufactured
4	Production sequence number
5	Manufacturing site
6	Miscellaneous characteristic

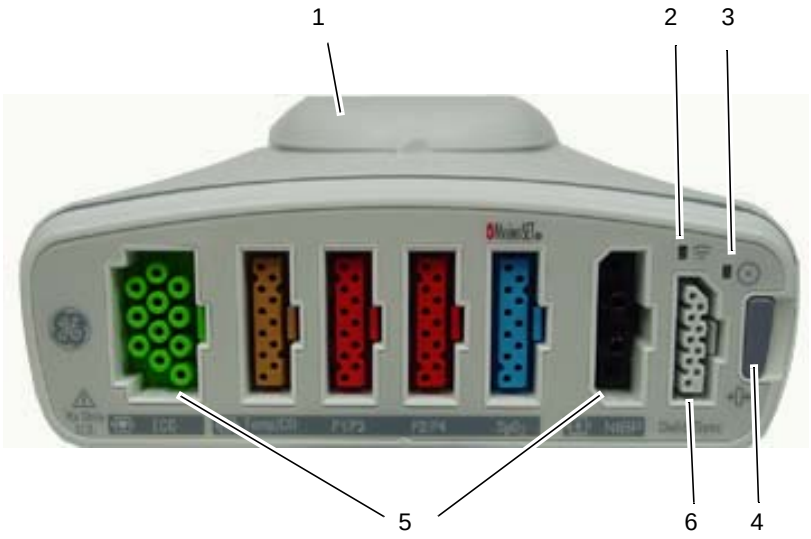
[1]Product code for the Patient Data Module is **SA3**.

2 Equipment Overview

Overview

The Patient Data Module is a data acquisition device for a GE modular system. It provides a connection from the host monitor to the patient, processes the patient data signals and stores a limited amount of patient data (24 hours captured at 1 minute resolution) for seamless transport.

Front view



404B

1	Expansion cover (expansion mount for future expansion modules)
2	Communication icon and indicator
3	Power icon and indicator
4	Power ON/IBP Zero All button
5	Patient cable connectors
6	**Defib/Sync** (for auxiliary equipment)

Rear view

405B

1	ePort host interface connection
2	Battery door

Side view

406A

1	Expansion cover
2	Docking station
3	Pull tab

Controls

The power/zero all key has a dual role as a power on and zero all.

- Power on — Turns the data acquisition function ON. Power is derived from a battery or patient monitor. When turned on, the function changes to the zero all function.
- Zero all — Zeros all invasive pressure lines which are open to atmosphere. Each pressure can also be zeroed, if desired, with a menu option in the pressure menu.

Indicators

Communication

The following LED condition identifies the communication status with a bedside or transport patient monitor.

- No light indicates no communication.
- Solid amber indicates an application reset.
- Solid green indicates communication.
- Flashing amber indicates communication failure.
- Alternately flashing with the power LED indicates software transfer.

Power

The following LED condition identifies the power status.

- No light indicates no power applied.
- Solid amber indicates software booting up.
- Solid green indicates powered by AC-derived mains or battery.
- Flashing amber indicates approximately five minutes battery power remaining.
- Alternately flashing with the communication LED indicates software transfer.

Connector

Patient Data Modules connect to a bedside or transport patient monitor using the host interface connector. It carries power, communication, and analog output signals to the display device.

Basic components

Battery

The Patient Data Module is designed to operate on battery power when used with a transport monitor or whenever AC power is interrupted. A complete battery management system allows you to obtain maximum battery performance. When connected to a bedside monitor, audible and visual alarms alert you when loss of power is imminent, and on-screen capacity gauges on the transport monitor indicate battery charge condition and capacity.

Patient Data Module ePort host interface cable

The Patient Data Module ePort host interface cable provides external power and communication between the Patient Data Module and a patient or transport monitor.

Docking stations

There are three versions of docking stations:

- Bedside dock for use with Solar 8000M/i patient monitor.
- Transport dock for use with Transport Pro patient monitor.
- Fixed mount adapter (mini dock) for use with mounting hardware.

Patient Data Module bedside dock

The Patient Data Module bedside dock is used for mounting the Patient Data Module to a bedside patient monitor. It has a host interface connection which delivers power, provides communication and allows easy connection with a patient monitor.

Patient Data Module transport dock

The Patient Data Module transport dock is attached to a transport patient monitor when it ships from the factory. It is fastened to the back of the transport patient monitor and delivers power, provides communication and allows easy connection and disconnection.

Patient Data Module fixed mount adapter (mini dock)

The Patient Data Module fixed mount adapter provides a mechanical connection between the Patient Data Module and mounting hardware. There are no electrical connections on the mini dock.

Views

Patient Data Module bedside dock.

480A

Patient Data Module fixed mount adapter (mini dock).

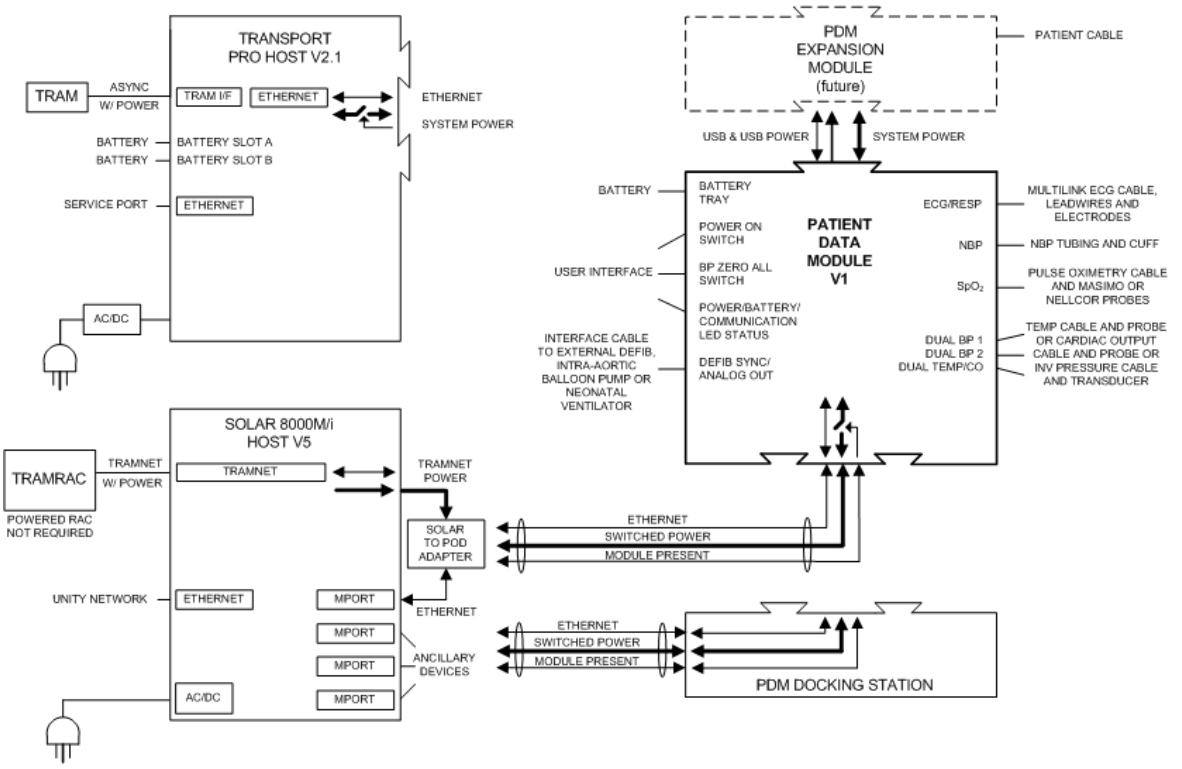
481A

Theory of operation

Overview

The Patient Data Module is a portable acquisition device. It collects data from a patient, converts the data to a digital form for processing, and sends the data to a bedside, transport or surgical monitor for further processing and display.

The data that it collects, converts, and sends includes the patient's vital signs and physiological waveforms. It also stores patient history including trends and special events, and setup information such as blood pressure zero points and alarm limit settings. The patient history is stored so that the collected information is transferred when a patient is transferred to a different monitor.



413B

The Patient Data Module shares power and communicates with host devices through the host interface connection called the ePort. The Patient Data Module connects directly to a transport patient monitor through a docking station. The Patient Data Module connects to a bedside host patient monitor through the host interface cable and docking station.

The Patient Data Module contains software and hardware to monitor the following parameters:

- ECG/respiration
- Noninvasive blood pressure
- Pulse oximetry

- Up to four channels of invasive blood pressure and cardiac output or two channels of temperature.
- Defibrillator sync/analog out interface

3 Installation

Battery

Test the battery charge

Before installing a battery, verify the battery's state of charge. Press the green **TEST** button on the battery. The number of charge level indicator LEDs that illuminate measures the approximate charge remaining in the battery.

- Four LEDs illuminated: 75% – 100% of full charge capacity.
- Three LEDs illuminated: 50% – 74.9% of full charge capacity.
- Two LEDs illuminated: 25% – 49.9% of full charge capacity.
- One LED illuminated: 10% – 24.9% of full charge capacity.
- One LED flashing: < 10% of full charge capacity remaining.

Install or change the battery

1. Open the battery door by gently pulling on the battery door pull tab.

862A

2. Pull the battery tray out of the Patient Data Module using the battery tray strap and remove the battery.
3. Insert the new battery with the test button facing up and the arrow pointing into the Patient Data Module.

855A

4. Press the battery door closed until it seals the battery compartment.

WARNING
PHYSICAL INJURY—Make sure the battery is completely inserted and that the battery door is securely sealed.

Falling batteries could seriously or fatally injure neonatal or other vulnerable patients.

5. Press the **Power** button on the Patient Data Module.
6. Verify that the **Power** indicator illuminates amber while the Patient Data Module boots up, then illuminates green.

Software

The Patient Data Module leaves the factory with software installed. If you need to install the software, contact your GE representative.

Mounting options

WARNING
For safety reasons, all connectors for patient cables and sensor leads are designed to prevent inadvertent disconnection, should someone pull on the leads. Do not route cables in a way that they may present a stumbling hazard.

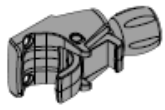
WARNING
PHYSICAL INJURY—Do not hang articles on the IV pole that are not related to the Patient Data Module's use.

Do not place the Patient Data Module more than 147 cm (58 in) from the floor when mounting on an IV pole with a base not less than 58 cm (23 in) in diameter.

WARNING
To reduce the ingress of water into the equipment, do *not* mount the Patient Data Module in a vertical position with the patient cables facing up or down.

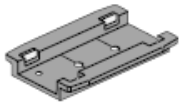
482A

Mounting options include mounting to a bed headboard or footboard, an IV pole, or a roll stand using one of the docking stations. Mounting kits include all necessary hardware and installation instructions.

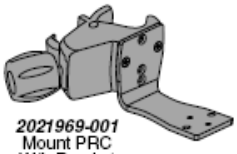


2021963-001
Pole/Rail Clamp

2021967-001
Mount PDM L-Bracket

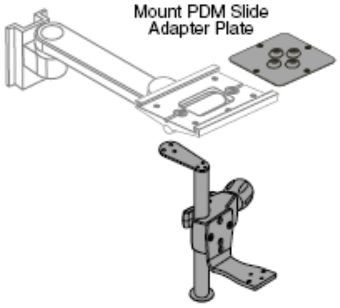


2021968-001
Mount PDM Mini Dock

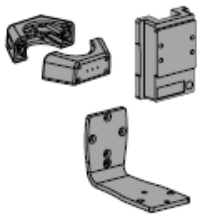


2021969-001
Mount PRC
W/L-Bracket

2034357-001
Mount PDM Slide
Adapter Plate



2022677-001
Mount PDM M-Arm
Down-Post



2022676-001
Mount PDM GCX
Rollstand/Wall Channel

483A

Connect to host patient monitor

Connect to transport bedside monitor

If using the Patient Data Module with a transport bedside monitor,

1. Guide the mounting rails of the Patient Data Module onto the transport dock mounting rails.
2. Slide the Patient Data Module toward the ePort until the locking key secures it to the transport dock.

Connect to bedside monitor

If using the Patient Data Module with a bedside monitor,

1. Connect one end of the ePort host interface cable to the Patient Data Module ePort connector.
2. Connect the other end of the ePort host interface cable to the Solar to Patient Data Module adapter on the back of the Solar 8000M/i patient monitor.

4 Service Tool and Configuration

Overview

The Patient Data Module service tool provides the following:

- Device information
- Configuration including asset setting, ECG filter configuration, licensing and software transfer
- Diagnostics
- Calibration

All service functions for the Patient Data Module are performed through a service laptop.

Required equipment

The following is a list of equipment to use with the GEHC MS service tool.

If servicing the Patient Data Module using a Solar 8000M/I patient monitor:

- PC with Microsoft® Windows® XP or 2000™ operating system, a CD-ROM drive, and a network card
- Category 5 crossover cable (2028822-001)
- ePort to host interface cable (2017098-002)
- Solar 8000M/i patient monitor with PDM service adapter (2028845-002)
- Patient Data Module software CD with GEHC MS Service Tool

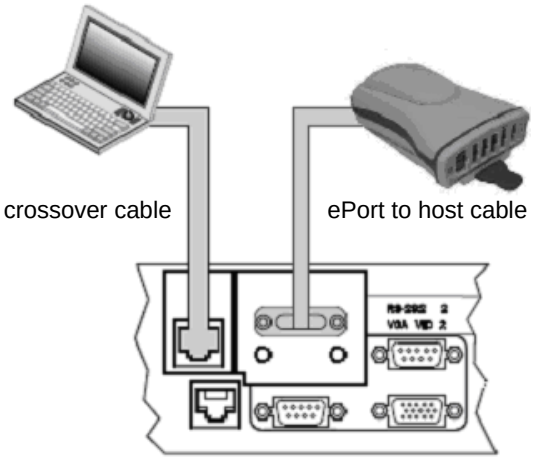
If servicing the Patient Data Module without a host patient monitor:

- PDM Service Tool Kit (2030924-001)

Set up the PC

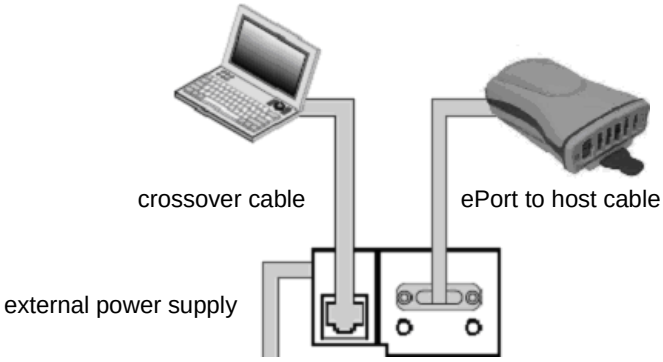
Connect the PC to the Patient Data Module

There are two ways to connect the PC to the Patient Data Module. One method uses power from the Solar 8000M/i patient monitor, the other method uses an external power supply.



430A

Power from Solar 8000M/i patient monitor



431A

Power from external power supply

1. Connect the category 5 crossover cable between the PC network port and the PDM service adapter.
2. Connect the ePort to host interface cable between the ePort on the Patient Data Module and the **ePort** connector on the PDM service adapter.
3. If the PDM service adapter is not connected to a Solar 8000M/i patient monitor, connect the external power supply to the PDM service adapter.
4. Remove the Patient Data Module battery.
5. Press the power button on the Patient Data Module.
6. Power on the PC.

Change the PC's IP address

NOTE

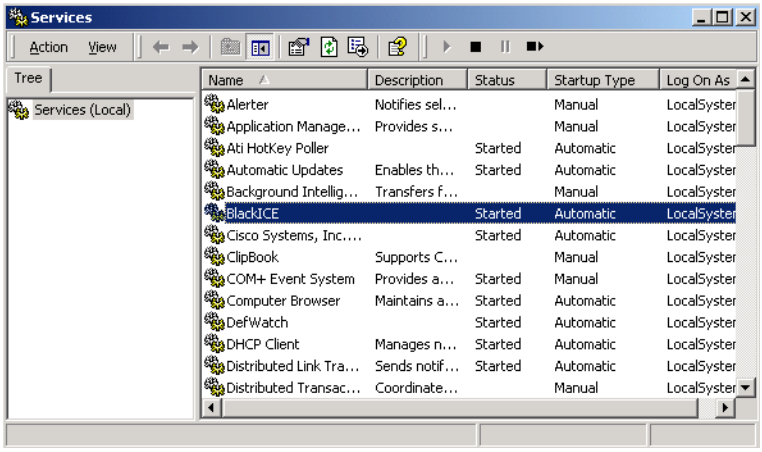
Disable all network ports on the PC except the Patient Data Module connection.

	Windows XP	Windows 2000
1.	From the toolbar, select ***Start*** > ***Run***	
2.	Type **cmd** and press **Enter**.	
3.	Type **ipconfig<space>/all** and press **Enter**.	
4.	If the IP address and subnet mask are defined, record them: ■ IP address: _____ ■ Subnet mask: _____	
5.	From the toolbar, select ***Start*** > ***Control Panel*** > ***Network Connections***.	From the toolbar, select ***Start*** > ***Settings*** > ***Control Panel*** > ***Network and Dial-up Connections***.
6.	Right-click ***Local Area Connection.***	
7.	Select ***Properties***.	
8.	Select ***Internet protocol (TCP/IP)***.	
9.	Click ***Properties***.	
10.	Select ***Use the following IP address***.	
11.	In the ***IP address*** field, type **192.168.252.95**.	
12	In the ***Subnet mask*** field, type **255.255.255.0**	
13.	If prompted to restart the PC, select ***Yes***.	
18.	Continue with the instructions, Disable firewall and networking services on page 4-4.	

Disable firewall and networking services

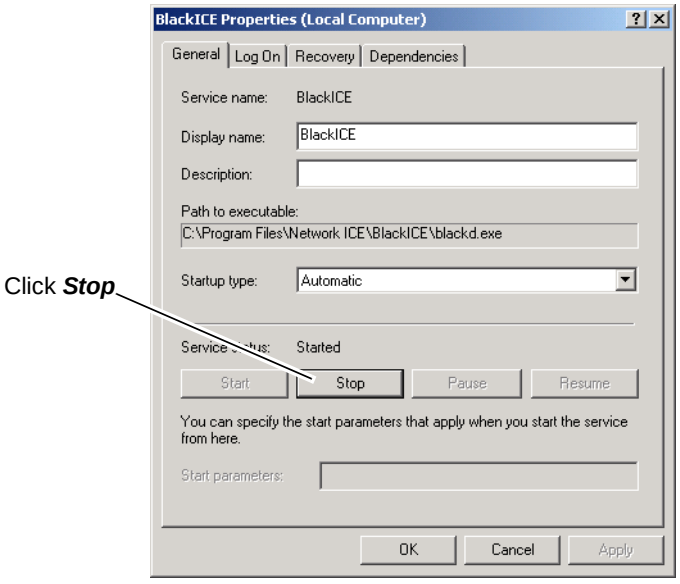
If your PC is running any firewall protection or networking services, such as Cisco Systems VPN, BlackICE, Security Accounts Manager or a wireless network card, perform the following procedure to disable these services on the PC.

1. Select one of the following from the toolbar:
   - In Windows XP, select ***Start*** > ***Control Panel*** > ***Administrative Tools*** > ***Services***.
   - In Windows 2000, select ***Start*** > ***Settings*** > ***Control Panel*** > ***Administrative Tools*** > ***Services***.
2. In the list of available firewall and networking services, double-click the service (e.g. Black ICE and Security Accounts Manager) to be disabled.


Services
Action View
Tree
Services (Local)
Name Description Status Startup Type Log On As
Alerter Notifies sel... Manual LocalSyster
Application Manage... Provides s... Manual LocalSyster
Ati HotKey Poller Started Automatic LocalSyster
Automatic Updates Enables th... Started Automatic LocalSyster
Background Intellig... Transfers f... Manual LocalSyster
BlackICE Started Automatic LocalSyster
Cisco Systems, Inc.... Started Automatic LocalSyster
ClipBook Supports C... Manual LocalSyster
COM+ Event System Provides a... Started Manual LocalSyster
Computer Browser Maintains a... Started Automatic LocalSyster
DefWatch Started Automatic LocalSyster
DHCP Client Manages n... Started Automatic LocalSyster
Distributed Link Tra... Sends notif... Started Automatic LocalSyster
Distributed Transac... Coordinate... Manual LocalSyster

455A

3. In the specific service (e.g. BlackICE and Security Accounts Manager) properties window, select ***Stop***.



456A

4. Verify that the ***Service status*** reads ***Stopped***.

5. To disable the Security Accounts Manager, select ***Disable*** from the ***Startup type*** drop down list.
6. Select ***Apply*** to disable the Security Accounts Manager.
7. Select ***Ok*** and close all windows.
8. Repeat these steps for all VPN, wireless network cards or any firewall protection programs running on your PC.

NOTE

If you are unsure of the firewall and networking services on your PC, contact your local IT administrator for details. Windows 2000 and XP PC's allow you to send a list of services to your IT administrator.

Enter the Patient Data Module service tool

1. Properly connect and configure the Patient Data Module and service laptop as described in Set up the PC on page 4-2.
2. Insert the Patient Data Module software CD in the CD-ROM drive. The ***GEHC MS Tool*** application opens automatically.

   If the ***GEHC MS Tool*** application does not launch, open the CD-ROM drive and double-click ***ShellExecute.js***.
3. Type the username and password and click ***login*** or press **Enter** on the keyboard.

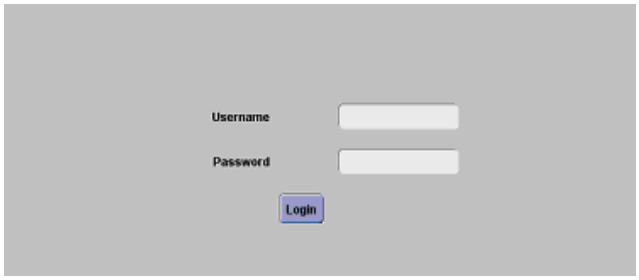
   Username: **biomed**

   Password: **ChangeMe**

NOTE

Username and password are case sensitive.

Username and password cannot be created, edited or deleted.



433A

Service tool modules

The GEHC MS Service Tool has four categories; ***Device Information***, ***Configuration***, ***Diagnostics***, and ***Calibration***. Each category contains module(s) for servicing the Patient Data Module. Click on the category tab, then the module. The following is a brief overview of these modules.

NOTE

Some information displayed in the module, only updates in 30 second intervals.

The GEHC MS Service Tool provides a basic description of each module in the ***Help*** file. From the toolbar in the module, click ***Help*** > ***Help***.

Device Information

The ***Device Information*** module displays general information about the Patient Data Module. and calibration information. It also displays the last date and times that NBP calibration, analog-out IP calibration, and analog-out ECG calibration was performed.

NOTE

To print the ***Device Information*** page, connect a parallel printer or enable a network port that has connectivity to a network printer. Click ***File*** > ***Print***. After printing, disconnect or disable the network port used for printing to prevent inadvertent access to the Patient Data Module.

434A

Configuration

The ***Configuration*** category consists of ***Asset Settings***, ***ECG Filter Config***, ***Licensing*** and ***Software Transfer*** modules.

Asset Settings

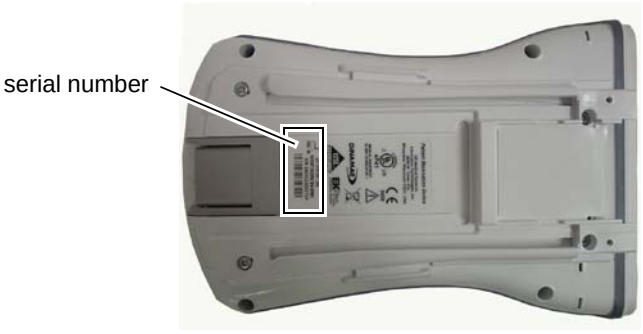
The ***Asset Settings*** module displays the manufacturer's serial number and the user assigned asset number.

1. Enter the serial number and click ***Submit***.

NOTE

The manufacturer's serial number must follow the specific format found on the serial number label on the Patient Data Module.

The manufacturer's serial number must be edited if the main cpu board is replaced.



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2. Enter the user assigned asset number and click ***Submit***.

NOTE

The user assigned asset number can be up to 13 alphanumeric characters.

ECG Filter Config

The ***ECG Filter Config*** module allows configuration of the power frequency and ECG filter.

The power frequency of the Patient Data Module must match the power frequency of the host patient monitor.

The ECG filter is always enabled. It can be disabled temporarily, but it will always default to ***Enabled*** after a power cycle or reboot.

CAUTION
Do not disable ***ECG Filter*** during clinical use.

Licensing

The Licensing module is used for activating or removing license(s). To obtain a license, contact GE technical support and provide the Patient Data Module serial number and MAC address. See the "How to Reach Us..." page included with this manual for contact information.

Enter the activation code and click ***Activate*** to complete the installation. Click ***Remove*** to remove a license.

NOTE

After installation, perform the checkout procedures provided in the host patient monitor service manual.

A new activation code must be requested and entered if the main cpu board is replaced.

Software Transfer

The ***Software Transfer*** module is used for installing Patient Data Module software. Follow the instructions displayed on the screen.

To power cycle the Patient Data Module, disconnect and reconnect the ePort host interface connector.

CAUTION
Do not disconnect the power during software transfer. The Patient Data Module could be damaged.

NOTE

After installation, perform the checkout procedures provided in the host patient monitor service manual.

Diagnostics

The ***Diagnostics*** category consists of ***Log Files*** and ***Service Metrics*** modules.

Log Files

The ***Log Files*** module allows viewing and downloading log files. Messages and errors in log files provide useful information to a trained technician.

Click ***View Log*** to view or ***Download Log*** to download the log file.

Service Metrics

The ***Service Metrics*** module displays various Patient Data Module statistics. ***NBP STATISTICS*** can be useful in determining NBP usage.

Click ***REFRESH ALL*** to refresh the data.

The following buttons clear NBP data:

- ***NBP Pump Run time***
- ***NBP Deflate Valve Cycle Count***
- ***NBP Dump Valve Cycle Count***
- ***NBP Pump Cycle Count***

NOTE

Some Patient Data Module statistics only update every 30 seconds.

After replacing the NBP pump assembly, clear all NBP statistics and perform the checkout procedures provided in the host patient monitor service manual.

If a value in the ***Service Metrics*** module is out of specification, the data field will be highlighted red. Contact GE technical support. See the "How to Reach Us..." page included with this manual for contact information.

Calibration

The ***Calibration*** category consists of ***Analog-Out ECG Calibration*** and ***Analog-Out IP Calibration***. The following additional equipment in required to perform this calibration:

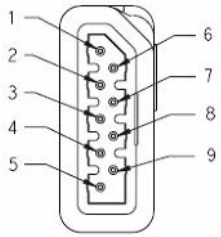
- Unterminated defib sync cable (2017842-001, part of the Patient Data Module Service Tool Kit)
- Digital voltmeter

1. Connect the unterminated cable to the **Defib/ Sync** connector on the front of the Patient Data Module.
2. Click ***Start Calibration*** to begin the calibration process.
3. Follow instructions displayed on screen.

NOTE

To abort the calibration process with no changes, press ***Stop Calibration***.

4. Measure voltages indicated below using the digital voltmeter.



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To calibrate Analog-Out ECG, measure voltage across the following pins.

Pin	Wire color	Signal name
1	Brown	ECG_ANALOG_OUT
6	Green	ANALOG_RETURN

To calibrate Analog-Out IP, measure voltage across the following pins.

Pin	Wire color	Signal name
2	Red	BP_ANALOG_OUT
6	Green	ANALOG_RETURN

5. Type in or use the scroll buttons to enter the measured voltage from the digital voltmeter.
6. Click ***OK*** to confirm the measured voltage.

NOTE

Perform calibration if the main cpu board is replaced.

After calibration perform the checkout procedures provided in the host patient monitor service manual.

5 Maintenance

Maintenance schedule

Manufacturer recommendations

To help ensure the equipment remains in proper operational and functional order, adhere to a good maintenance schedule. The manufacturer recommends that the following be performed by service personnel upon receipt of the equipment, every 12 months thereafter, and every time the unit is serviced:

- Visual inspection
- Cleaning
- Battery maintenance
- Electrical safety tests (See the Solar 8000M/i patient monitor v5 service manual, Maintenance and checkout chapter for system tests.)
- Checkout procedures (See the Solar 8000M/i patient monitor v5 service manual, Maintenance and checkout chapter for system tests.)

Manufacturer responsibility

WARNING
Failure on the part of all responsible individuals, hospitals or institutions, employing the use of this device, to implement the recommended maintenance schedule may cause equipment failure and possible health hazards. The manufacturer does not, in any manner, assume the responsibility for performing the recommended maintenance schedule, unless an Equipment Maintenance Agreement exists. The sole responsibility rests with the individuals, hospitals, or institutions utilizing the device.

Inspection

Remove power and all cables before inspecting or cleaning the equipment.

Inspect the equipment and its components carefully prior to installation, once every 12 months thereafter and each time the equipment is serviced. Do not use the equipment if damage is determined. Refer damaged equipment to qualified service personnel.

- Inspect the case for cracks or other physical damage.
- Inspect cables for fraying or other damage.
- Inspect all plugs and connectors for bent pins or other damage.
- Check for loose or missing screws on the mounting hardware.

NOTE

Damaged cables or equipment should be replaced by service personnel.

Cleaning

Precautions

Improper cleaning methods can result in degradation of the equipment performance and/or failure. To avoid damage to the equipment:

- Never use conductive solutions, solutions that contain chlorides, wax, or wax compounds to clean the equipment.
- Never immerse equipment in any liquid.
- Never pour or spray any liquid on the equipment or permit fluid to seep into connections or openings.
- Never autoclave or steam clean the equipment.
- Never use the following solutions; acetone, Bentadine, ketone, alcohol-based cleaners, sodium salts, abrasive cleaners or any type of Ammonium Chloride such as Dimethyl Benzyl Ammonium Chloride or Quaternary Ammonium Chloride.
- Never connect the device to a patient until it is thoroughly dry.

Cleaning procedures

CAUTION
Failure to follow these rules may melt, distort, or dull the finish of the case, blur lettering on the labels, or cause equipment failures.

1. Remove power, all cables and batteries.
2. Close the battery door.
3. Wipe the exterior with a soft, lint-free cloth using one of the following solutions recommended in the APIC Guidelines for Selection and Use of Disinfectants (1996):
   - Sodium hypochlorite (5.2% household bleach) minimum 1:500 dilution (minimum 100 ppm free chlorine) and maximum 1:10 dilution.
   - Any sodium hypochlorite wipe product that meets the above guidelines.

   NOTE

   Wring excess disinfectant from cloth before using.

   Contact of disinfectant solutions with metal parts may cause corrosion.

   Do not damage or bend connector pins when cleaning or drying.
4. Allow solution to remain on device for a minimum of one minute or per hospital guidelines.
5. Do not let fluid “pool” around connection pins. If this happens, blot dry with a cotton swab or soft cloth. Shake out excess liquids from connector recesses.
6. Wipe off cleaning solution with a clean, moist cloth.

7. Dry thoroughly with a clean, dry, lint-free cloth and let air dry for at least 30 minutes. Do not apply heat.

NOTE

Drying times may vary based on the environmental conditions.

Storage

- Remove batteries when the device is not in use, even for short periods of time.
- Store in a dry well-ventilated area.
- Hang the device using a holder if available.
- If leadwires or cables are attached, hang them straight.
- Do not coil leadwires or cables tightly around the device.

Consequences of using improper cleaning product

- Appearance of waveforms when the device is not connected to a patient, causing false alarms instead of a leads fail alarm and possibly not providing a visual or audible leads fail alarm.
- Brittle and breaking device case.
- Overall system performance degradation.
- Melting, dulling, or distorting the case.
- Total medical device failure requiring replacement.
- Unit malfunction.
- Void warranty.

Cleaning products to avoid

Cleaning products known to cause the types of problems listed above include, but are not limited to:

- Sani-Cloth® Wipes
- Ascepti® Wipes
- HB Quat®
- Clorox® Wipes (they do not contain bleach)
- Over-the-counter detergents (e.g. Fantastic®, Tilex®, etc.).

Products that contain active ingredients and solutions similar to these products should also be avoided.

NOTE

For additional information, refer to the How the Reach Us page in the manual for contact information.

Expansion interface cleaning

Under normal operation, the expansion interface should not require cleaning. If the expansion interface does require cleaning, follow these instructions.

CAUTION

- The expansion interface is not waterproof.
- Do not let fluids enter the electronics through the expansion interface.
- Do not spray fluid into the expansion interface.
- Cleaning the expansion interface in a manner other than that specified below may cause the unit to malfunction and void the warranty.

1. Use a cellular urethane cleaning swab lightly moistened with one of the following solutions recommended in the APIC Guidelines for Selection and Use of Disinfectants (1996):

   - Sodium hypochlorite (5.2% household bleach) minimum 1:500 dilution (minimum 100 ppm free chlorine) and maximum 1:10 dilution.
   - Any sodium hypochlorite wipe product that meets the above guidelines.

   NOTE

   Wring excess disinfectant from cloth before using.

   Contact of disinfectant solutions with metal parts may cause corrosion.

   Do not damage or bend connector pins when cleaning or drying.

2. Insert the swab under the expansion interface to clean.

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NOTE

Avoid inserting the swab toward the rear of the expansion interface where connector pins can be damaged.

3. Do not let fluid “pool” around connection pins. If this happens, blot dry with a cotton swab or soft cloth. Shake out excess liquids from connector recesses.

4. Wipe off cleaning solution with a clean, moist swab.
5. Dry thoroughly with a clean, dry, swab and let air dry for at least 30 minutes. Do not apply heat.

NOTE

Drying times may vary based on the environmental conditions.

Battery compartment cleaning

Under normal operation, the battery compartment should not require cleaning. If the battery compartment does require cleaning, follow these instructions.

CAUTION

- The battery compartment is not waterproof.
- Do not let fluids enter the electronics through the air holes in the battery compartment floor.
- Cleaning the battery compartment in a manner other than that specified below may cause the unit to malfunction and void the warranty.

1. Remove the battery from the battery compartment.
2. Clean the device with a gauze pad or cloth lightly moistened with one of the following:
   - Water
   - Soap
3. Use a cloth lightly moistened with distilled water to rinse away the cleaning solution. Make sure moisture does not enter the electronics area below the battery compartment floor.
4. Dry thoroughly with a lint-free cloth. Allow the battery compartment to air dry completely prior to closing the compartment door.

Sterilization

NOTE

EtO sterilization is *not recommended*, but may be required for cables and leadwires. Frequent sterilization will reduce the useful life of cables and leadwires.

Sterilize with ethylene oxide gas (EtO) at a maximum temperature of 50º C (122º F). After EtO sterilization, follow the recommendations from the sterilizer manufacturer for required aeration.

Battery care

The Lithium-Ion battery is a rechargeable battery containing Lithium-Ion cells. Each battery contains an integrated electronic fuel gauge and a safety protection circuit. The processor within the equipment communicates with both the battery and the charger.

The following are facts about Lithium-Ion battery technology:

- The battery discharges on its own, even when it is not installed in the equipment. This discharge is the result of the Lithium-Ion cells and the bias current required for the integrated electronics.
- The self-discharge rate doubles for every 10°C (18°F) rise in temperature.
- The capacity loss of the battery degrades significantly at higher temperatures.
- As the battery ages, the full-charge capacity of the battery degrades and is permanently lost. As a result, the amount of charge that is stored and available for use is reduced.

The following terms are used to define the battery capacity:

- Design capacity — The theoretical capacity of the battery cells when the battery is new.
- Full charge capacity — The actual amount of charge the battery can store and deliver.
- Remaining charge capacity — The amount of full charge capacity currently remaining in the battery. This is a percent of full charge capacity.

Use recommendations

GE recommends the following methods to improve battery performance:

- Location — Position the equipment in a location that does not artificially increase the operating temperature of the batteries.
- Charging method — Whenever possible, use the Cadex SMart Two+ charger to charge the battery. The Cadex SMart Two+ charger maintains a lower battery cell temperature during the charge cycle. This reduction in temperature can extend the life of the battery.
- Conditioning guideline — Remove the batteries from the equipment every six months and condition it using the Cadex SMart Two+ charger. This condition cycle recalibrates the electronic fuel gauge.

Storage recommendations

Store the battery outside of the device at a temperature between 20°C to 25°C (68°F to 77°F). Storing the battery inside the Patient Data Module is *not* recommended for the following reasons:

- In a device that is powered by an AC power source, the battery cell temperature increases by 10°C to 15°C (18°F to 27°F) above the room's ambient temperature. This reduces the life of the battery.

- In a device that is powered by an AC power source (“floating”), the battery self-discharges to less than 90% of its full charge capacity after approximately two weeks. The battery is then recharged to 100% resulting in a 95% average state of charge. Storing the battery at a high state of charge also reduces the life of the battery. GE recommends that you remove the battery and store it near the Patient Data Module until it is needed.

Charge the battery

The battery can be charged by one of two methods:

- Inside a Patient Data Module that is connected to a powered host.
- Outside the Patient Data Module using a Cadex Smart2+ Battery Charger.

Charge with a Cadex Smart2+ battery charger

1. Insert the battery into the battery charger. The **RUN** LED lights.
2. Leave the battery in the charger until the **READY** LED lights

   NOTE

   If the **FAIL** LED lights, remove the battery from the battery charger and reinsert it. This corrects any battery charger time out errors. If the **FAIL** LED still lights, replace the battery.

Charge inside the Patient Data Module

The battery charges whenever the Patient Data Module is connected to an AC powered host.

Condition the battery

Remove or replace the battery

1. Open the battery door at the rear of the Patient Data Module.
2. Remove the battery.
3. Insert a new battery with the connection pins inserted first and facing down.
4. Close the battery door.
5. Connect Patient Data Module to a host patient monitor and confirm that the battery LED lights green and the battery icon displays in the lower corner of the patient monitor.

Recycle the battery

Recycle the battery when it no longer holds a charge. Remove the battery from the Patient Data Module and follow your local recycling guidelines.

WARNING
EXPLOSION HAZARD—Do not incinerate the battery or store at high temperatures. Serious injury or death could result.

In the United States and Canada, the Rechargeable Battery Recycling Corporation (RBRC) can help locate your nearest rechargeable battery collection site. Contact them by

- telephone: 1-800-8-BATTERY (800-822-8837)
- internet: www.rbrc.org

Checkout procedures and NBP calibration

GE recommends that qualified service personnel perform system checkout procedures (including electrical safety tests, parameter tests, and NBP calibration) found in the Solar 8000M/i patient monitor service manual:

- upon receipt of the equipment,
- every 12 months thereafter,
- any time the equipment is serviced, or
- any time the validity of the NBP pressure readings is in doubt.

6 Troubleshooting

Overview

The problems and solutions in this chapter represent only a few of the faults that you may encounter and are not intended to cover every possible problem that may occur.

Required tools and equipment

The following lists necessary tools for troubleshooting:

- Patient Data Module software CD with GEHC MS service tool (shipped with Patient Data Module)
- Solar 8000M/i patient monitor with PDM service adapter (2028845-002)
- PC with Microsoft Windows XP or 2000 operating system, a CDROM drive, and a network card
- Category 5 crossover cable (2028822-001)
- ePort to host interface cable (2017098-002)

If troubleshooting the Patient Data Module without a host patient monitor:

- PDM Service Tool Kit (2030924-001)

Before you begin. . .

Before beginning any detailed troubleshooting, complete a thorough visual inspection to be sure

- All I/O cable connections are secured
- All patient devices are properly powered
- PC with GEHC MS Service Tool is properly connected to the Patient Data Module

  See Connect the PC to the Patient Data Module on page 4-2 for details.

Problems and solutions

Problem	Solution
Battery is not charging	Check the Patient Data Module's battery interface as follows. 1. Check for damage to the battery tray. If damaged, replace the battery tray. See chapter 7, Field Replaceable Units for ordering parts and replacement procedures. 2. Check for damage to the battery connector inside the battery compartment. If damaged, contact GE technical support to service the Patient Data Module. See the "How to Reach Us..." page included with this manual for contact information. 3. Check that the battery is charging by inserting a known good battery in the Patient Data Module. If not charging, contact GE technical support to service the Patient Data Module. See the "How to Reach Us..." page included with this manual for contact information. Check the Patient Data Module's battery as follows. 1. Check that the battery is fully charged by pressing the **TEST** button on the battery. If the LED is not at 100%, go to Battery care on page 5-7 for further charging and conditioning procedures. 2. Check for damage to the battery connector and external surfaces. If damaged, replace the battery. 3. Check that the battery is charging with the GE approved battery charger. See Battery care on page 5-7 for procedures. If not charging, replace the battery.
External surface is damaged	Check the Patient Data Module's top housing as follows. 1. Check for cracks or other damage to the top housing. If damaged, replace the top housing. See chapter 7, Field Replaceable Units for ordering parts and replacement procedures. 2. Check for cracks or other damage to the bottom housing. If damaged, contact GE technical support to service the Patient Data Module. See the "How to Reach Us..." page included with this manual for contact information.
NBP is not functioning	Check the NBP calibration date and time as follows. 1. Use the GEHC MS service tool (See chapter 4, Service Tool and Configuration) and go to the ***Device Information*** module. 2. If NBP is not calibrated, perform the NBP calibration according to the procedures in the Solar 8000M/i service manual, Maintenance and checkout chapter. Check the NBP performance as follows. 1. Go to the Solar 8000M/i patient monitor service manual Maintenance and checkout chapter and perform the NBP calibration check. 2. If NBP pressure is leaking (not maintaining ***CUFF*** pressure for at least one minute), check for leakage on the NBP cuff. (Listen for hissing as air escapes.) 3. If the cuff is not leaking, use the GEHC MS service tool (See chapter 4, Service Tool and Configuration) and go to ***Diagnostics*** > ***Service Metrics*** (See Diagnostics on page 4-10). Record the NBP statistics information for trending. 4. Replace the NBP assembly with manifold. See chapter 7, Field Replaceable Units for ordering parts and replacement procedures.

Problem	Solution
No power	1. Check for damage to the ePort to host interface cable. If damaged, replace the cable. 2. Check for damage to the Tram-net port on the patient monitor. If damaged, go to the Solar 8000M/i patient monitor service manual, Field replaceable units chapter for ordering parts. 3. Connect a known good Patient Data Module to the patient monitor. If the Patient Data Module is not powering, go to the Solar 8000M/i patient monitor service manual Troubleshooting chapter for further information. 4. Check for damage to the ePort interface on the Patient Data Module. If damaged, contact GE technical support to service the Patient Data Module. See the “How to Reach Us...” page included with this manual for contact information. 5. Check the Patient Data Module’s battery following steps in the ‘Battery is not charging’ section in this table.
No communication indicators (LEDs not illuminated)	1. At the patient monitor, check the M-Port status LED. If it is not green, go to the Solar 8000M/i patient monitor service manual Troubleshooting chapter for further information. 2. Follow steps in the ‘No power’ section in this table.
No parameters	1. Check for damage to the parameter cable(s). If damaged, replace cables. 2. Check for damage to the parameter interface. If damaged, contact GE technical support to service the Patient Data Module. See the “How to Reach Us...” page included with this manual for contact information. 3. Check for licensing using the GEHC MS service tool. (See chapter 4, Service Tool and Configuration). Go to ***Configuration*** > ***Licensing***. If license is not activated, install the license(s). 4. Check that the patient monitor is configured to display the parameter.
Noisy waveforms, missing markers or inaccurate patient data	Check for ECG configuration filter using the GEHC MS service tool (See chapter 4, Service Tool and Configuration) as follows. 1. Go to ***Configuration*** > ***ECG Config Filter***. 2. Check that the Patient Data Module power frequency setting matches the patient monitor’s power frequency setting. 3. Check that ***ECG Config Filter*** is enabled. If this does not correct the problem, follow steps in the ‘No parameter’ section in this table.
Patient Data Module will not dock	1. Check for damage to mounting rails. If damaged, replace the mounting rails. 2. Check for damage to the docking station (bedside dock, transport dock, or mini-dock). If damaged replace the docking station.
GEHC MS service tool ‘red’ values	If the following values in are highlighted red, they are out of specification. See chapter 4, Service Tool and Configuration, ***Diagnostics*** > ***Service Metrics***. ■ Under ***TEMPERATURE & VOLTAGE RAILS*** if Main DSP voltage and temperature is red (out of specification) replace the Main cpu board. See chapter 7, Field Replaceable Units for ordering parts and replacement procedures. ■ Under ***TEMPERATURE & VOLTAGE RAILS*** if ARM and ECG voltage is red (out of specification), contact GE technical support to service the Patient Data Module. See the “How to Reach Us...” page included with this manual for contact information.

Error messages

The following error messages display at the patient monitor if there is a serious problem with the Patient Data Module.

Error message	Action
COMMUNICATION FAILURE	Go to See Problems and solutions on page 6-3.
BATTERY FAIL	Go to See Battery care on page 5-7.
SERVICE THE PDM	Contact GE technical support.

7 Field Replaceable Units

Ordering Parts

The parts lists in this chapter supply enough detail for you to order replaceable parts.

If you require additional information or troubleshooting assistance, contact GE Technical Support.

To order parts, contact Service Parts at the address or telephone number listed on the "How to Reach Us..." page included with this manual.

Parts

The table below lists replaceable assemblies that can be ordered.

Item Number	Description
2031069-002	Battery door and tray
2031069-003	Battery
2031069-004	Patient Data Module mount rail and pull tab
2031069-005	Label kit Nellcor
2031069-006	Label kit Masimo
2031069-007	NBP assembly with MFLD hose
2031069-008	NBP MFLD hose, coup, elbow only
2031069-009	Top housing
2031069-010	Main cpu (includes software CD)
2031069-011	Expansion cover
2028783-001	Solar to Patient Data Module adapter
2017098-001	ePort to host interface cable, 5 ft.
2017098-002	ePort to host interface cable, 10ft.
2017098-003	ePort to host interface cable, 15 ft.
2017098-004	ePort to host interface cable, 20ft.
2017098-005	ePort to host interface cable, 25 ft.
2021968-001	Fixed mount adapter (Mini dock)
2030340-001	Bedside dock
2030341-001	Transport dock

Disassembly guidelines

WARNING
REPAIR TO THE FRU LEVEL—Field repairs are recommended to the field replaceable unit (FRU) only. Attempting a field repair on a pcb or a factory sealed component or assembly could jeopardize the safe and effective operation of the Patient Data Module.

NOTE

GE recommends using the new fasteners (screws, washers, etc.) provided in the FRU kits rather than re-using the old fasteners. Some fasteners are not intended to be re-used more than three times.

Take advantage of existing thread pattern cut by turning the screw counterclockwise until it drops into the existing thread pattern.

Tools required

A T10 TORX-style screwdriver and a standard set of hand tools are required for disassembly and assembly. Wearing safety glasses is recommended.

Before disassembly

Before disassembling the Patient Data Module, always do the following:

- Remove all cables.
- Remove the battery.
- Provide appropriate electrostatic discharge protection to prevent damaging the Patient Data Module. See Electrostatic discharge (ESD) precautions below for details.

Hardware precautions

Observe the following guidelines when disassembling the Patient Data Module:

- Note the positions of wires, cables and different sized screws; marking them if necessary to ensure they are replaced correctly.
- *Do not* kink, pinch, stretch, twist, or tightly fold a flex cable.

Electrostatic discharge (ESD) precautions

All external connectors of the Patient Data Module are designed with protection from ESD damage. However if the module requires service, exposed components and assemblies inside are susceptible to ESD damage. This includes human hands, non-ESD protected work stations or improperly grounded test equipment.

The following guidelines may not guaranty a 100% static-free workstation, but can greatly reduce the potential for failure of any electronic assemblies being serviced:

- Discharge any static charge you may have built up before handling semiconductors or assemblies containing semiconductors.
- A grounded, antistatic wristband (3M part number 2046 or equivalent) or heel strap should be worn at all times while handling or repairing assemblies containing semiconductors.
- Use properly grounded soldering and test equipment.
- Use a static-free work surface (3M part number 8210 or equivalent) while handling or working on assemblies containing semiconductors.
- *Do not* remove semiconductors or assemblies containing semiconductors from antistatic containers (Velo-stat bags) until absolutely necessary.
- Make sure power to an assembly is turned off before removing or inserting a semiconductor.
- *Do not* slide semiconductors or electrical/electronic assemblies across any surface.
- *Do not* touch semiconductor leads unless absolutely necessary.
- Semiconductors and electronic assemblies should be stored only in antistatic bags or boxes.
- Handle all PCB assemblies by their edges.
- *Do not* flex or twist a circuit board.

Replacement procedures

Unless otherwise stated, reassemble the Patient Data Module in reverse order of disassembly.

Battery

1. Open the battery door by gently pulling on the battery door pull tab.

862A

2. Pull the battery tray out of the Patient Data Module using the battery tray strap and remove the battery.
3. Insert the new battery with the test button facing up and the arrow pointing into the Patient Data Module.

855A

4. Press the battery door closed until it seals the battery compartment.

WARNING
PHYSICAL INJURY—Make sure the battery is completely inserted and that the battery door is securely sealed.

Falling batteries could seriously or fatally injure neonatal or other vulnerable patients.

5. Press the **Power** button on the Patient Data Module.
6. Verify that the **Power** LED illuminates amber while the Patient Data Module boots up, then illuminates green.

404B

Labels

Apply labels as shown.

404B

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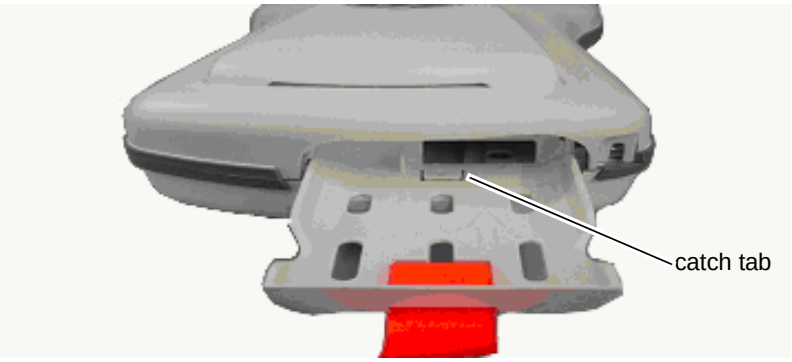
Battery door and tray

1. Remove 1 screw that holds the battery door to the housing and remove the door and washer.

462A

2. Remove the battery if one is in the tray.
3. Use a flathead screw driver to lift the catch tab on the tray as you pull it out of the housing.



468A

Mount rail and pull tab

1. Remove 2 screws on the latch stop. Remove the latch stop.

463A

2. Grasp the pull tab between thumb and index finger as shown and gently pull it straight out about a half inch. Lift the assembly out of the rail slot.

469A

NOTE

In the event that the pull tab assembly comes apart when pulled from the rail slot, reassemble as shown below.

470A

471A

3. Remove 2 short screws at the rear of the mount rail and 2 long screws at the front of the mount rail.

464A

4. Unseat the mount rail by twisting it slightly. Lift mount rail off the top housing.

NOTE

When reassembling, make sure there are not gaps between the mount rail and the housing when re-seating.

Top housing

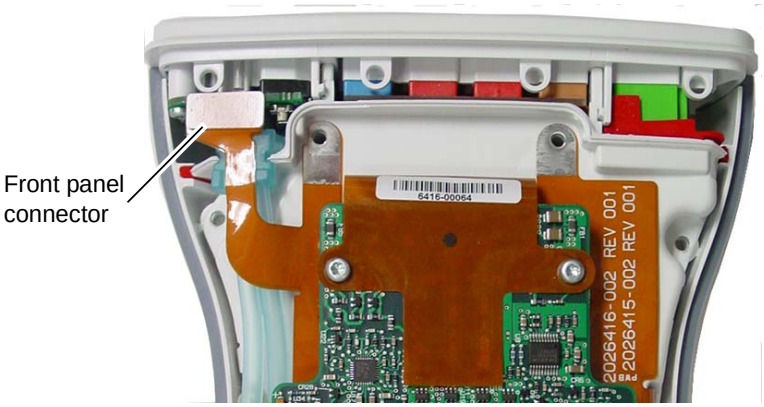
1. Remove the mount rail and pull tab per above steps.
2. Remove 4 machine screws that hold the top and bottom housing together.

464A

3. Turn the Patient Data Module right side up and lift off the top housing.
4. Install the top housing as follows:
   a. Inspect the gasket in the top housing to be sure it is securely placed in the groove.

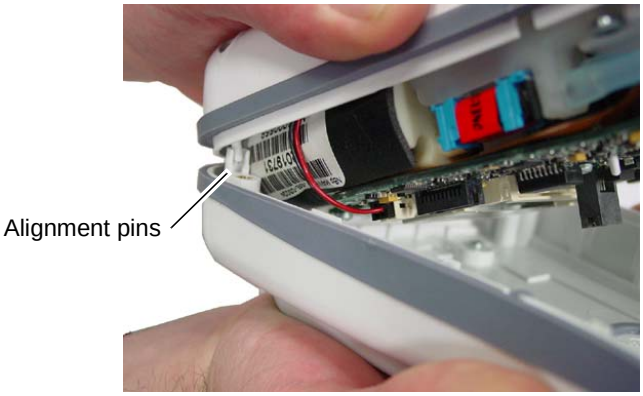
472A

   b. Make sure the flex connector to the front panel board is connected securely.



473A

c. Starting at the rear of the module, position alignment pins of the top housing into the bottom housing holes, then close the housing straight down.

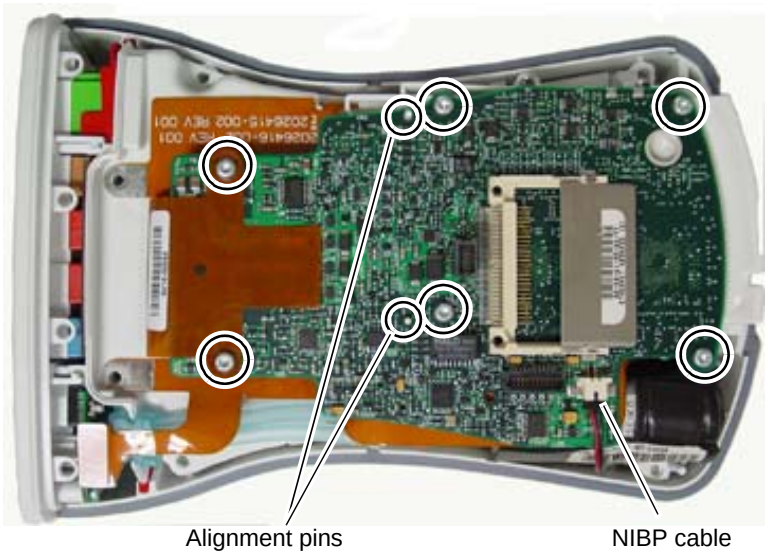


474A

d. Squeeze the top and bottom housings together to eliminate gaps. Install the screw near the Power ON button first.

Main board

1. Remove the top housing per above steps.
2. Disconnect the NIBP cable from the connector without pulling on the wires.

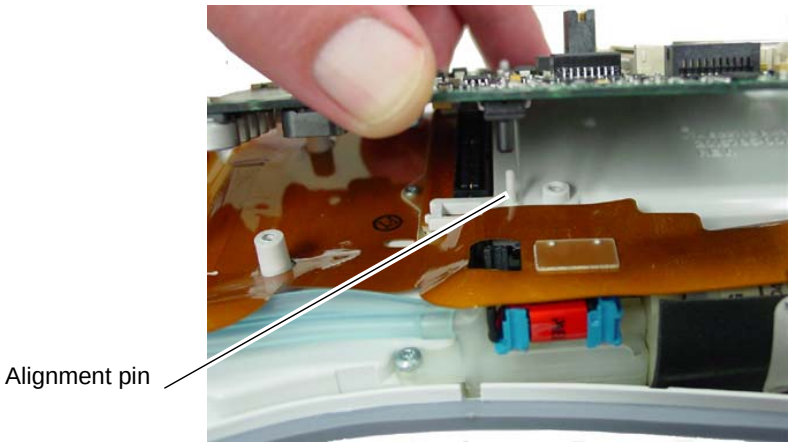


465A

3. Remove 6 screws on the main board.
4. Remove the main board.

NOTE

When installing the main board, position it into the alignment pins, (See figures above and below.) fold the flex material over the top of the board and hold in place while installing screws.

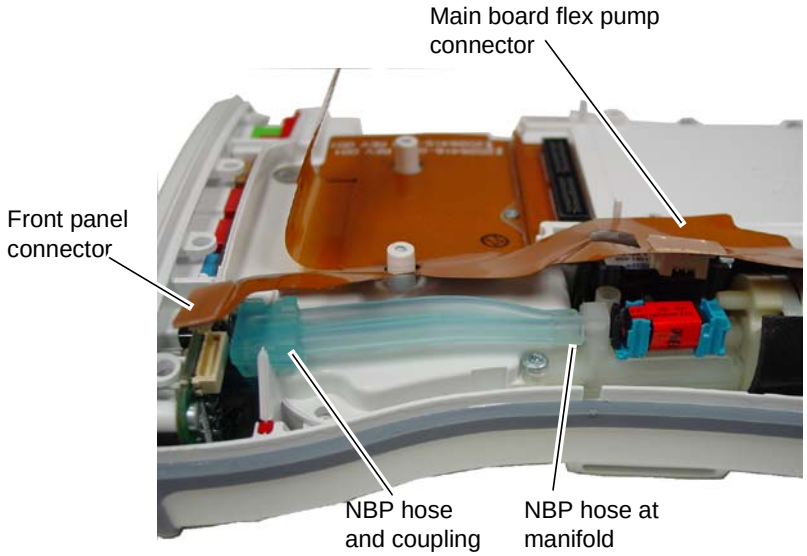


5. Load new software from the CD included in the Main board FRU kit. Go to Software Transfer on page 4-9 for instructions.
6. Calibrate analog out. Go to Calibration on page 4-10 for instructions.

7. Licensing information must be re-entered. Contact GE technical support and provide the Patient Data Module serial number and MAC address to proceed. See the “How to Reach Us...” page included with this manual for contact information. Go to Licensing on page 4-9 for instructions on entering the new activation code.
8. Manufacturer’s serial number must be re-entered. Go to Asset Settings on page 4-8 for instructions on entering the manufacturer’s serial number.
9. Go to the Solar 8000M/i patient monitor service manual and complete checkout procedures.

NBP hose, coupling and elbow

1. Remove the top housing and main board per above steps.
2. Disconnect the front panel connector.



477A

3. Disconnect the main board flex pump connector.
4. Hold flex out of the way and disconnect the NBP hose from the coupling.
5. Remove hose from the manifold.

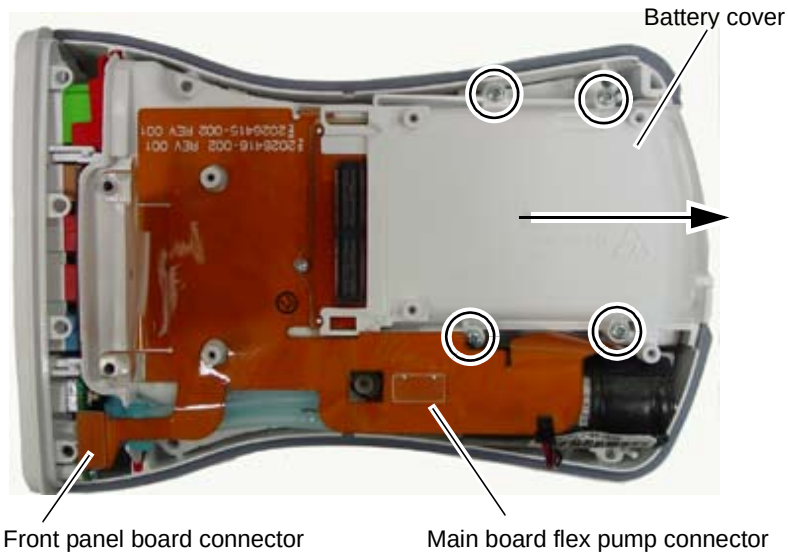
NOTE

When reassembling, slide hose all the way onto the manifold fitting so that the hose lays flat.

6. Go to the Solar 8000M/i patient monitor service manual and complete checkout procedures.

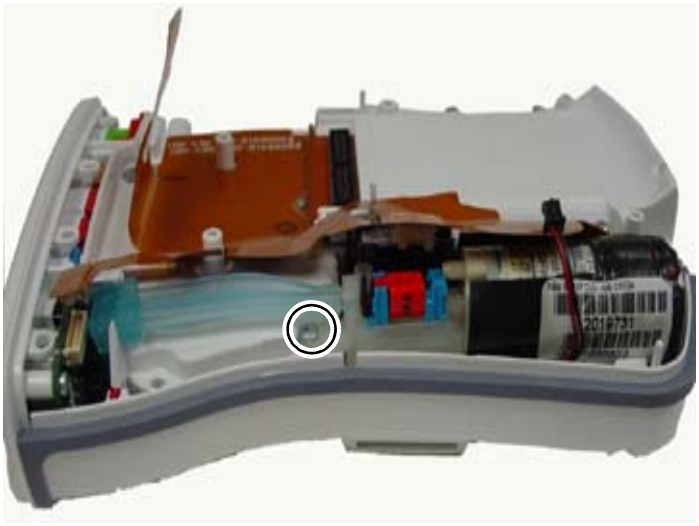
NBP assembly with manifold hose

1. Remove the top housing, main board, NBP hose, coupling and elbow per above steps.
2. Remove 4 screws from the battery cover.



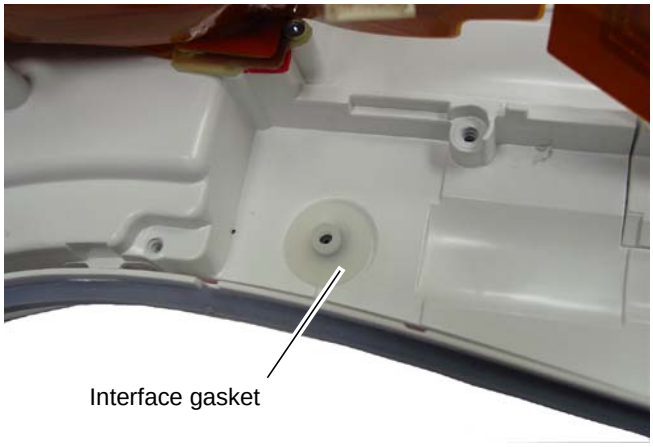
467A

3. Grasp and slide the battery cover out to the rear.
4. Remove 1 screw under the pump tube connection.



466A

5. Lift off the manifold with pump.
6. Remove the interface gasket.



478A

7. Before installing the NBP assembly with manifold:
   a. Make sure the pump and manifold are fully seated together.
   b. Make sure the gasket is in place.
   c. Position the manifold and pump in the bottom housing and carefully press to seat connector.
   d. Install the screw, then connect the hose. Slide hose all the way onto the manifold fitting so that the hose lays flat.
   e. Make sure the pump is resting between the positioning protrusions.
8. After replacing the NBP assembly with manifold, use the GEHC MS service tool to clear all NBP statistics and perform the checkout procedures in the Solar 8000M/i service manual, Maintenance and checkout chapter.

A Appendix A–Technical Specifications

Technical Specifications

Physical

Height:	7.0 cm (2.75 in)
Width:	14.6 cm (5.75 in)
Depth:	21.6 cm (8.5 in)
Weight:	1.1 kg (2.5 lbs.) without optional battery 1.3 kg (2.8 lbs.) with optional battery

Environmental

Power requirements Input voltage: Input current:	 8 to 17 Vdc 0.3A nominal at 16.75 V
Power consumption:	4.5 Watts, nominal
Cooling:	Natural convection
Operating heat dissipation:	10.2 Btu/Hr
NOTE System may not meet its performance specifications if stored or used outside the manufacturer's specified temperature and humidity ranges.	
Operating temperature and humidity:	10º C to 35º C (50º F to 95º F) 15% to 95% RH non-condensing
Storage temperature and humidity:	-40º C to 60º C (-40º F to 140º F) 15% to 95% RH non-condensing

Battery

Type:	Exchangeable lithium ion
Quantity:	One
Voltage:	11.1 V nominal
Capacity:	1.8 Amp hour nominal
Run time:	Approximately 3.5 hours with new fully charged battery
Charge time:	Approximately 2 hours
Battery life:	500 cycles to 50% capacity

ECG

Standard leads available:	I, II, III, V1 to V6, aVR, aVL, and aVF
Leads analyzed simultaneously:	Twelve (I, II, III, V1 to V6, aVR, aVL, and aVF)
Lead fail:	Identifies failed electrodes and switches to those intact
Lead fail sensing current:	Active electrodes: <30 nA each Reference electrode: <270 nA
Input specifications QRS detection range: Signal width: Heart rate range: Common mode rejection: Gain accuracy: Linearity deviation: Noise:	 ±0.5 mV to ±5 mV 40 ms to 120 ms (Q to S) 30 to 300 beats per minute 90 dB minimum at 60 Hz ±5% (diagnostic mode) ±5% <30 μV (referred to input)
Output specifications Frequency response	 Monitoring mode: 0.05 to 100 Hz 0.05 to 40 Hz 0.05 to 25 Hz Diagnostic mode: 0.05 to 150 Hz
Analog output:	Selectable at 1V/mV
Defibrillator sync/analog out delay	<35 ms
Sampling rate	Monitoring mode: 240 samples/second Diagnostic mode: 500 samples/second

Heart rate	Heart rate averaging: 8 / 4 beats Display update interval: 2 seconds Heart rate accuracy: ± 1% or ± 1 beat/minute, whichever is greater Response time: < 6 seconds Limit alarm delay: <10 seconds after limit alarm condition exceeded Heart rate alarm range: 0 to 300 beats/minute, high limit > low limit Arrhythmia analysis: 1 to 100 PVCs/minute Method: QRS morphology classification and timing based on single- or multiple-lead analysis Arrhythmia calls: Full, lethal only, or no arrhythmia PVC alarm limit range: 1 to 100 PVCs/minute
ST Segment analysis	
Measurement description:	ST segment deviation is measured and displayed for all acquired leads
ST display:	Lead label, ST deviation, current complex superimposed over a reference complex, J-point indicator and 15-minute mini-trends are shown for all acquired leads
Measurement point:	Measured at user-selectable measurement points (0, 30, 40, 50, 60, and 80 ms) following the J point
Measurement range:	-12.0 mm to + 12.0 mm
Display resolution:	0.1 mm
ST measurement averaging:	16 beats
ST alarm limits:	± 12 mm, high limit > low limit, for any event within a lead group (inferior, lateral or anterior) that exceeds the alarm limit for that group
Pace detection/rejection	
Input voltage range:	±2 mV to ±700 mV
Input pulse width:	0.1 ms to 2 ms
Rise time:	10 μs to 100 μs
Over/under shoot:	2 mV (maximum)
Mode:	Pacemaker artifact rejection ‘On’ or ‘Off’.
Standard leads available:	I, II, RL, LL

Respiration

Respiration range limit:	1 to 200 breaths/minute
Respiration rate accuracy	0 to 120 breaths/minute ± 1 121 to 200 breaths/minute ± 3
Impedance range:	100 to 1500 Ohms at 52.6 KHz
Detection sensitivity range:	0.4 to 10 Ohms impedance variation
Respiration rate alarm range:	1 to 200 breaths/minute
No breath alarm range:	3 to 30 seconds

Temperature

Number of channels:	Up to 2 (with Y-adapter cable)
Input specifications	Probe type: Series 400 or 700 (determined by input cable) Temperature range: 0° C to 45° C (32° F to 113° F) Resolution: ±0.01° C (internal)
Output specifications	Parameters displayed: T1, T2 Error (independent of source): ±0.1° C with series 400 probes ±0.3° C with series 700 probes
Alarms:	User-selectable upper and lower limits

Invasive blood pressure

Number of channels:	Up to 4 (with appropriate cables)
Transducer sites, site name and displayed values:	arterial (ART): systolic, diastolic, mean and rate femoral (FEM): systolic, diastolic, mean and rate pulmonary artery (PA): systolic, diastolic and mean central venous pressure (CVP): mean left atrial (LA): mean right atrial (RA): mean intracranial pressure (ICP): mean umbilical artery (UAC): systolic, diastolic, mean and rate umbilical vein (UVC): mean special pressure (SP): mean
Transducer requirements	Transducers meeting the following specifications can be used, however, have not been evaluated by UL. **NOTE** Note: UL Classification covers the following invasive blood pressure transducers: ■ Utah, Deltran IV CPT-400 ■ Edwards, PX600 ■ Bekton Dikinson, P23XL-1 ■ Abbot, 42582-08
Accuracy:	±2% or ±1 mmHg, whichever is greater (exclusive of transducer) ±2% or ±3 mmHg, whichever is greater (exclusive of Patient Data Module)
Over pressure rating:	500 kPa (4000 mmHg) above atmospheric pressure (all except catheter tip transducers)
Under pressure rating:	50 kPa (400 mmHg) below atmospheric pressure (all except catheter tip transducers)
Excitation voltage:	±2.5 V dc ±0.1%
Transducer output:	50 μV/V/cm Hg
Input specifications	
Range:	-25 mmHg to 349 mmHg
Offset:	±150 mmHg

Output specifications	
Frequency response:	dc to 40 Hz (+0/-3 dB)
Zero balance range:	±150 mmHg
Zero balance accuracy:	±1 mmHg
Accuracy:	±2% or ±1 mmHg, which ever is greater (exclusive of transducer)
Displayed frequency response:	0 to 12 Hz or 0 to 40 Hz (-3dB) user-selectable
Display scale selections:	0-30, 0-40, 0-60, 0-100, 0-160, 0-200, 0-300 mmHg
Analog output:	1 V/100 mmHg
Alarms:	User selectable upper and lower limits for systolic, diastolic, and mean pressures
Alarm range:	-99 to 350 mmHg

Non-invasive blood pressure

Measurement technique:	Oscillometric
Displayed parameters:	Systolic, diastolic, and mean pressures, pulse rate, time of last measurement
Measurement modes:	Manual, Auto, and Stat
Heart rate detection	Adult, pediatric and neonate: 30 to 240 beats per minute
Total cycle time:	20 to 40 seconds typical (dependent on heart rate and motion artifact)

Systolic pressure range	
	Adult: 30 to 290 mmHg
	Pediatric: 30 to 240 mmHg
	Neonatal: 30 to 140 mmHg
Diastolic pressure range	
	Adult: 10 to 220 mmHg
	Pediatric: 10 to 200 mmHg
	Neonatal: 10 to 110 mmHg
Mean pressure range	
	Adult: 20 to 260 mmHg
	Pediatric: 20 to 215 mmHg
	Neonatal: 20 to 125 mmHg
Cuff pressure range	
	Adult: 0 to 290 mmHg
	Pediatric: 0 to 250 mmHg
	Neonatal: 0 to 150 mmHg
Pressure accuracy	
	Static: ±2% or ±3 mmHg, whichever is greater
	Clinical: ±5 mmHg average error, 8 mmHg standard deviation
Automatic cycle times:	0 to 24 hours
Auto zero:	Zero pressure reference prior to each cuff inflation
Tubing length:	Variable
Automatic cuff deflation:	Cycle time exceeding 3 minutes (85 seconds neonatal), power off, or cuff pressure exceeds 290 mmHg (± 6 mmHg) for adult, 250 mmHg (± 5mmHg) for pediatric, or 150 mmHg (± 3mmHg) for neonatal
Cuff sizes	
	Disposable: Large adult, adult, small adult, pediatric, child, and neonatal
	Reusable: Adult thigh, large adult, adult, small adult, small adult/child, child, and infant
Alarms:	User-selectable upper and lower limits for systolic, diastolic, and mean pressures

Pulse oximetry (Sp02)

Parameters monitored:	Arterial oxygen saturation (SpO2) and peripheral pulse rate (PPR)
Probe types:	Masimo (reusable/single use) Nellcor (reusable/single use)
Masimo range	SpO2: 1 to 100% Pulse rate: 25 to 240 beats per minute
Masimo accuracy[1]	70 to 100% SpO2: ±2 <69% SpO2: Unspecified ±3 beats per minute without motion ±5 beats per minute with motion
Masimo patents	This device is covered under one or more of the following U.S.A. patents: 5,758,644, 5,823,950, 6,011,986, 6,157,850, 6,263,222, 6,501,975 and other applicable patents listed at http://www.masimo.com/patents.htm
Nellcor range	SpO2: 1 to 100% Pulse rate: 20 to 250 beats per minute
Nellcor accuracy[1]	70 to 100% SpO2: Adult ±2, neonatal ±3 <69% SpO2: Unspecified Pulse rate: ±3 beats per minute without motion
Analog output:	Selectable saturation 0 to 100% equivalent 0 to 1V
Alarm limit range:	SpO2: 0 to 100%
PPR:	0 to 350 beats per minute.
Messages: Nellcor:	***NO SENSOR, DEFECTIVE SENSOR, SENSOR OFF, UNRECOGNIZED SENSOR, LOW PERFUSION, PULSE SEARCH, INTERFERENCE DETECTED, AMBIENT LIGHT, LOW SIGNAL IQ*** ***PROBE OFF PATIENT, LOW QUALITY, PULSE SEARCH***

[1]Refer to manufacturer's specifications for probe accuracy statement.

Cardiac output

Method:	Thermodilution
Parameters Displayed:	Cardiac output, blood temperature, injectate temperature, real-time cardiac output washout curve, last average CO
Cardiac output range:	0.2 to 15 liters per minute
Blood temperature range:	17°C to 42°C (62°F to 107°F)
Blood temperature accuracy:	±0.5°C 17°C to 30°C
Injectate temperature range:	0°C to 30°C (32°F to 86°F)
Injectate temperature accuracy:	±0.3°C
Cardiac output review:	Accept/reject individual measurements and store average
Catheter sizes:	5, 6, 7, 7.5, or 8 French
Injuectate volume selections:	3, 5, or 10

Certifications

IEC/EN/UL 60601-1 CAN/CSA C22.2 No. 601.1 IEC/EN 60601-1-2 IEC/EN 60601-2-27 IEC/EN 60601-2-30 IEC/EN 60601-2-34 IEC/EN 60601-2-49 IEC/EN 60601-2-51
EN 12470-4 EN ISO 9919
ANSI/AAMI SP10 ANSI/AAMI EC11 ANSI/AAMI EC13
CE Marking: Medical Devices Directive - 93/42/EEC
JJG 760
YY 91079

Warranty

One year warranty

Appendix B– Electromagnetic Compatibility

Electromagnetic compatibility (EMC)

Changes or modifications to this system not expressly approved by GE can cause EMC issues with this or other equipment. This system is designed and tested to comply with applicable regulation regarding EMC and must be installed and put into service according to the EMC information stated in this appendix.

WARNING
Use of portable phones or other radio frequency (RF) emitting equipment near the system may cause unexpected or adverse operation.

WARNING
The equipment or system should not be used adjacent to, or stacked with, other equipment. If adjacent or stacked use is necessary, the equipment or system should be tested to verify normal operation in the configuration in which it is being used.

Guidance and manufacturer's declaration – electromagnetic emissions

The Patient Data Module is intended for use in the electromagnetic environment specified below. It is the responsibility of the customer or user to assure that the Patient Data Module is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment – Guidance
RF Emissions EN 55011	Group 1	The equipment uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions EN 55011	Class A	The equipment is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions EN 61000-3-2	Class A	
Voltage Fluctuations/ Flicker Emissions EN 61000-3-3	Complies	

Guidance and manufacturer's declaration – electromagnetic immunity

The Patient Data Module is intended for use in the electromagnetic environment specified below. It is the responsibility of the customer or user to assure that the Patient Data Module is used in such an environment.

Immunity Test	EN 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Electrostatic Discharge (ESD) EN 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical Fast Transient/Burst EN 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power should be that of a typical commercial or hospital environment.
Surge EN 61000-4-5	± 1 kV differential mode ± 2 kV common mode	± 1 kV differential mode ± 2 kV common mode	Mains power should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines EN 61000-4-11	<5% U_t (>95% dip in U_t) for 0.5 cycles <40% U_t (>60% dip in U_t) for 5 cycles <70% U_t (>30% dip in U_t) for 25 cycles <5% U_t (>95% dip in U_t) for 5 s	<5% U_t (>95% dip in U_t) for 0.5 cycles <40% U_t (>60% dip in U_t) for 5 cycles <70% U_t (>30% dip in U_t) for 25 cycles <5% U_t (>95% dip in U_t) for 5 s	Mains power should be that of a typical commercial or hospital environment. If the user of the equipment requires continued operation during power mains interruptions, it is recommended that the equipment be powered from an uninterruptible power supply or a battery.
Power Frequency (50/60 Hz) Magnetic Field EN 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

NOTE

U_t is the AC mains voltage prior to application of the test level.

Immunity Test	EN 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Conducted RF EN 61000-4-6 Radiated RF EN 61000-4-3	3 Vrms 150 KHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3 V rms 3 V/m	Portable and mobile RF communications equipment should not be used closer to any part of the equipment, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.5 GHz where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer, and *d* is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site surveys, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol:

Note 1: At 80 MHz and 800 MHz, the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by reflection from structures, objects, and people.

[a]Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the equipment is used exceeds the applicable RF compliance level above, the equipment should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the equipment.

[b]Over the frequency range 150 KHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances

The following table provides the recommended separation distances (in meters) between portable and mobile RF communications equipment and the Patient Data Module.

The Patient Data Module is intended for use in the electromagnetic environment on which radiated RF disturbances are controlled. The customer or the user of the Patient Data Module can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment

(transmitters) and the Patient Data Module as recommended below, according to the maximum output power of the communications equipment.

	Separation Distance in Meters (m) According to Frequency of Transmitter		
Rated Maximum Output Power of Transmitter in Watts	**150 kHz to 80 MHz[a]** $d = 1.2\sqrt{P}$	**80 MHz to 800 MHz [a]** $d = 1.2\sqrt{P}$	**800 MHz to 2.5 GHz[a]** $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
[a]At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.			

For transmitters rated at a maximum output power not listed above, the recommended separation distance [*d*] in meters (m) can be estimated using the equitation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE

These guidelines may not apply in all instances. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Compliant cables and accessories

WARNING
The use of accessories, transducers and cables other than those specified may result in increased emissions or decreased immunity performance of the equipment or system.

The table below lists cables, transducers, and other applicable accessories with which GE claims EMC compliance.

NOTE

Any supplied accessories that do not affect EMC compliance are not included.

Category	Description	Maximum Lengths
ECG Cables		
	Cable, ECG 3/5 lead Multi-Link	6 m / 20 ft
	Compatible ECG trunk cable, 5-lead	3 m / 10 ft
	Compatible ECG trunk cable, 3-lead	3 m / 10 ft

Category	Description	Maximum Lengths
	Care cable, ECG 3-lead Multi-Link w/grabber	3.6 m / 12 ft
	Care cable, ECG 3/5-lead Multi-Link	3.6 m / 12 ft
	Care cable, ECG 3-lead Multi-Link din, neonatal	3.6 m / 12 ft
	Care cable, ECG 6-lead Multi-Link	3.6 m / 12 ft
	Care cable, ECG 12-lead Multi-Link	3.6 m / 12 ft
	Care cable, ECG 12-lead ESU Multi-Link	3.6 m / 12 ft
	Care cable, ECG 3/5-lead ESU Multi-Link	3.6 m / 12 ft
ECG Multi-link Leadwires		
	Lead wire set, 5-lead, Multi-Link-group, grabber	130 cm / 51 in
	Lead wire set, 3-lead, Multi-Link-group, grabber	130 cm / 51 in
	Lead wire set, 5-lead, Multi-Link, grabber	130 cm / 51 in
	Lead wire set, 5-lead, Multi-Link, grabber V2-V6	130 cm / 51 in
	Lead wire set, 3-lead, Multi-Link, MiniGrab Ld I	74 cm / 29 in
	Lead wire set, 3-lead, Multi-Link, adult graber Ld II	74 cm / 29 in
	Lead wire set, Multi-Link individual grabber	130 cm / 51 in
	Lead wire set, Multi-Link individual snap	130 cm / 51 in
	Lead wire set, Multi-Link individual grabber V2-V6	130 cm / 51 in
	Lead wire set, 5-lead, Multi-Link, snap	130 cm / 51 in
	Lead wire set, 5-lead, Multi-Link-group, snap	130 cm / 51 in
	Lead wire set, 3-lead, Multi-Link-group, snap	130 cm / 51 in
	Lead wire set, Multi-Link, neonatal, mini-clip/DIN	60 cm / 24 in
	Lead wire set, Multi-Link, banana, limb leads	130 cm / 51 in
	Lead wire set, Multi-Link, banana, V-leads, C-leads	130 cm / 51 in
	Lead wire set, Multi-Link, radiotranslucent grabber	1.6 m / 60 in
	Lead wire set, 6-lead, Multi-Link, snap	130 cm / 51 in
	Lead wire set, 6-lead, Multi-Link, grab	130 cm / 51 in
	10-lead, banana, AHA, RL-V6	130 cm / 51 in
Invasive BP Cables and Transducers		
	IP cable Utah	3.6 m / 12 ft
	IP cable Spectramed	3.6 m / 12 ft
	IP cable Abbott Transpac-III	3.6 m / 12 ft
	IP cable, bifurcated, dual BP adapter	30 cm / 12 in
	Care IP cable, Utah	3.6 m / 12 ft
	Care dual IP cable, Utah	3.6 m / 12 ft

Category	Description	Maximum Lengths
	Care IP cable, Abbott Transpac-IV	3.6 m / 12 ft
	Care dual IP cable, Abbott Transpac-IV	3.6 m / 12 ft
	Care IP Edwards Life Sciences Truwave adapter cable	3.6 m / 12 ft
	Care dual IP Edwards Life Sciences Truwave adapter cable	3.6 m / 12 ft
	Care IP Spectramed cable	3.6 m / 12 ft
	Care dual IP Spectramed cable	3.6 m / 12 ft
	Utah Disposable transducers	N/A
	Spectramed transducers	N/A
	Abbott Transpac-III transducers	N/A
	Edwards Truwave transducers	N/A
Cardiac Output Cables and Probes		
	Cardiac Output Cable	3.6 m / 12 ft
	Cardiac Output Probe	2.4 m / 8 ft
Temperature Cables and Probes		
	Dual Temp Cable	20 cm / 8 in
	Dual Temp Cable	1.2 m / 4 ft
	Temp Probe Interconnect cable, 400 series	3.6 m / 12 ft
	Care cable, dual temp 400/700 series	0.5 m / 1.6 ft
	Care cable, temp 400/700 series	0.5 m / 1.6 ft
	Care cable, temp single to disp 400/700 series	3.6 m / 12 ft
SpO2 cables and sensors		
	Cable Masimo LNC-10 GE connector	3.0 m / 9.8 ft
	Patient adapter cable - Nellcor DIGICAL - 3m (one wire removed)	3.0 m / 0.8 ft
	Care SpO2 patient adapter cable - Masimo	3.6 m / 12 ft
	Care SpO2 patient adapter cable - Nellcor DIGICAL	3.6 m / 12 ft
	Masimo disposable adhesive sensor, LNOP-ADT, adult	N/A
	Masimo disposable adhesive sensor, LNOP-PDT, pediatric	N/A
	Masimo disposable adhesive sensor bridge, LNOP-Neo, neonatal	N/A
	Masimo disposable adhesive sensor, LNOP-NeoPt-L, neonatal	N/A
	Masimo reusable multsite sensor, LNOP-YI	N/A
	Masimo reusable sensor, pediatric	N/A

Category	Description	Maximum Lengths
	Masimo reusable sensor, finger	N/A
	Masimo sensor LNCS Adtx adult adhesive	N/A
	Masimo sensor LNCS Pdtx PED adhesive	N/A
	Masimo sensor LNCS Inf-L infant adhesive	N/A
	Masimo sensor LNCS Neo-L neonatal adhesive	N/A
	Masimo sensor LNCS NeoPt-L NEOPT neonatal adhesive	N/A
	Masimo sensor LNCS DCI adult reusable	N/A
	Masimo sensor LNCS DCIP ped reusable	N/A
	Masimo sensor LNCS Y1 multisite reusable	N/A
	Masimo sensor LNCS TC-I TIP-CLIP ear reusable	N/A
	Masimo sensor LNCS TF-I reusable forehead	N/A
	Masimo sensor LNOP DC_195 reusable finger sensor	N/A
	Masimo sensor LNOP DCSC reusable spot check sensor	N/A
	Masimo sensor LNOP DC-12 reusable spot check sensor	N/A
	Masimo sensor LNOPTF-I reusable forehead sensor	N/A
	Masimo sensor LNOP NEO-L neonate adhesive sensor	N/A
	Masimo sensor LNOP NEOPT-L sensitive skin neo adhesive sensor	N/A
	Masimo sensor LNOP INF-L infant adhesive sensor	N/A
	Masimo sensor LNOP NEO-bridge neonate adhesive sensor	N/A
	Masimo sensor LNOP NEOPT-sensitive skin bridge neonate adhesive sensor	N/A
	Masimo sensor LNOPv In disposable infant sensor	N/A
	Masimo sensor LNOPv Ne disposable neonate sensor	N/A
	Masimo sensor LNOPv Ad disposable adult sensor	N/A
	Masimo adult adhesive LNOP sensors	N/A
	Masimo pediatric adhesive LNOP sensors	N/A
	Masimo infant/pediatric LNOP HiFi sensor	N/A
	Masimo neonatal/adult LNOP HiFi sensor	N/A
	Masimo infant/pediatric LNOP thumb/toe sensor	N/A
	Nellcor OxiMax MaxFast forehead sensor	N/A
	Nellcor OxiMax adhesive sensor, adult	N/A
	Nellcor OxiMax adhesive sensor, adult long	N/A

Category	Description	Maximum Lengths
	Nellcor OxiMax adhesive sensor, pediatric	N/A
	Nellcor OxiMax adhesive sensor, infant	N/A
	Nellcor OxiMax adhesive sensor, neonatal	N/A
	Nellcor OxiMax adhesive sensor, nasal	N/A
	SC-PR	N/A
	Nellcor SoftCare nonadhesive sensor, neonate	N/A
	Nellcor SoftCare nonadhesive sensor, adult	N/A
	Nellcor Durasensor DS-100A finger-clip sensor, reusable adult	N/A
	Nellcor Oxiband OXI-A/N, adult, neonatal, reusable	N/A
	Nellcor Oxiband OXI-P/I, pediatric/infant, reusable	N/A
	Nellcor Dura-Y D-YS, multi-site sensor	N/A
	Nellcor D-YSE ear clip for Dura_Y sensor	N/A
	Nellcor PediCheck D-YSPD pediatric spot check sensor	N/A
	Nellcor OxiCliq adhesive sensor - adult	N/A
	Nellcor OxiCliq adhesive sensor - neonatal/adult	N/A
	Nellcor OxiCliq adhesive sensor - infant	N/A
	Nellcor OxiCliq adhesive sensor - pediatric	N/A
Accessories		
	Cable, defib sync to unterminated end 15’	4.6 m / 15 ft
	Cable, defib sync to Physio-Control 15’	4.6 m / 15 ft
	Cable, defib sync to DataScp 95-31’	9.5 m / 31 ft
	Cable, defib sync to AAMI 6P ECG 4.6 m	4.6 m / 15 ft
	Cable, defib sync to HP/Philips 18’	5.5 m / 18 ft
	ePort cable	7.6 m / 25 ft.

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